

TEN NEW SPECIES OF *EREMOPHILA* (MYOPORACEAE) FROM CENTRAL AND WESTERN AUSTRALIA

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Abstract

Ten new species of *Eremophila* are described from Central and Western Australia, namely *E. alatisepala* (S.W. Qld), *E. arachnoides* (SA, WA), *E. bicolor* (WA), *E. biserrata* (WA), *E. gibbosa* (WA), *E. glutinosa* (WA), *E. ovata* (NT), *E. purpurascens* (WA), *E. serpens* (WA), and *E. verrucosa* (SA). Two subspecies are distinguished in both *E. arachnoides* and *E. verrucosa*. Each species is illustrated, and distribution maps, ecological, cytological and horticultural data are provided where available.

Introduction

When Kraenzlin published his monograph of the Myoporaceae in 1929 he recognized the three genera *Eremophila*, *Pholidia* and *Stenochilus* described by Robert Brown in 1810. Until 1859 Ferdinand Mueller, who had made a particular study of the Australian Myoporaceae and had published the majority of species then known, also recognized these three genera. However, as new species came to hand he found it more difficult to recognize them, and eventually in 1859 he reduced *Pholidia* and *Stenochilus* to synonymy in *Eremophila*.

Kraenzlin's treatment of the genera *Eremophila*, *Pholidia* and *Stenochilus* was quite inadequate and Mueller's later view is still followed in Australia. Kraenzlin's sections are quite artificial and in many instances illegitimate because he ignored previous work on the genera. The main value of the monograph was that it was the first comprehensive treatment of the family since that of Bentham (1870) bringing together the numerous species which had been published since 1870.

Subsequent to Kraenzlin's monograph an additional thirteen species have been added to *Eremophila* by Gardner (1934, 1942), White (1944), Smith (1956), Shaw (1967), Dell (1975) and Henderson (1978). A few of these species have resulted directly or indirectly from regional studies of *Eremophila* (Smith 1956, Henderson 1978), but the majority consisted of miscellaneous additions to the genus.

It will be a few years before I can complete the revision of the genus, which I have undertaken largely because of the many new species involved and several species complexes which will require considerable field work. However, at this point I consider it appropriate to publish a small number of these new taxa for two reasons: firstly, to update the knowledge of the species found in central Australia in preparation for the treatment of the genus in the proposed "Flora of Central Australia"; secondly, to provide names for a number of species now widespread in cultivation and which have horticultural merit.

Most sectional treatments of *Eremophila* are unsatisfactory. In the present paper only those species in sections *Stenochilus* (R.Br.) F. Muell. and *Pholidia* (R.Br.) F. Muell., which are considered to be clearly delimited, are placed in sections at this stage.

Descriptions, with few exceptions, have been based on both living and dried material and most illustrations were made from live material supplemented, where necessary, by preserved specimens. Herbarium abbreviations follow Holmgren and Keuken (1974) except for King's Park Herbarium, Perth, which is designated KP.

1. *Eremophila ovata* Chinnock sp. nov.

Ab *Eremophila strongylophylla* F. Muell. differt lamina folii ovata, petiolo longiore subtereti, indumento calycis, stylo hirsuto et fructu minore pilis tenuioribus brevioribusque. (Fig. 1)



Fig. 1. *Eremophila ovata* Chinnock (A-I) and *E. strongylophylla* F. Muell. (J-N). A, habit; B-F, M, N, leaf variation; G, J, inner and outer surfaces of calyx-segment, respectively; H, K, basal hairs on outer surface of calyx-segment. I, L, mature fruit showing size difference and length of indumentum. (A-C, G, H, I, Lutz 379; D, Chippendale 3591; E, Tate AD95709089; F, Beaglehole 20561; J-L, Ashby 3881; M, N, Chinnock 3756).

Type: 30 miles (48 km) S of Areyonga, Northern Territory, P.K. Latz 379, 13.xii.1968, fl.fr. (holotype: NT; isotypes: AD, BRI).

The specific epithet refers to the leaf shape.

Rounded odorous *shrub* to 1 m tall and broad. *Branchlets* terete, densely pubescent; hairs of three types — short stellate, short glandular and numerous longer glandular hairs, 1-1.5 mm long; indumentum of young growth often brownish-yellow. *Leaves* alternate, distinctly petiolate; petiole subterete, (0.35-)0.5-0.7(-1.1) cm long, with indumentum as for lamina; lamina sparsely to densely stellate pubescent on the lower surface, slightly less densely hairy to glabrous on the upper, with scattered short glandular hairs on one or both surfaces, ovate or more rarely ovate-elliptic to almost orbicular; apex acute, more rarely obtuse, (0.8-)1.0-2.5(-3.5) cm long, (0.6-)0.9-1.4(-1.7) cm broad. *Flowers* solitary, sessile or subsessile; pedicel 0.2 mm long, densely stellate-pubescent. *Calyx* 5-partite, non-imbricate; segments almost equal, densely pubescent outside; the hairs stellate and glandular, with many longer glandular and eglandular sectaceous long hairs 1-1.5 mm, and glandular hairy inside in the upper part, with sparsely to densely, simple or branched eglandular hairs and scattered short glandular hairs in the lower part, narrow linear-triangular to linear-lanceolate, 9-12 mm long. *Corolla* 2-2.5 cm long, lilac to scarlet, moderately sub-stellate pubescent outside except for the constricted lower part of the tube; inside of tube arachnoid hairy, the lobes glabrous or the lowermost lobe with a few hairs towards the base; narrow cylindrical in the lower tube for c. 6 mm abruptly dilating above; lobes 5, the upper lip consisting of two lobes, the lower of three, obtuse, the lowermost lobe dilated. *Stamens* included; filaments and anthers glabrous. *Ovary* oblong-ovoid, densely tomentose; the hairs stellate to branched; 2-3 mm long, 1.5 mm broad; style sparsely hirsute in the lower two-thirds. *Fruit* dry; indumentum as for ovary, ovoid 4.5-6.5 mm long, 4 mm broad. *Seed* white, oblong c. 2.5 mm long, c. 0.8 mm broad, 1 or 2 per fruit.

Distribution

Northern Territory — restricted to the George Gill and Gardiner Ranges (Map 1).

Specimens examined

Bagots Spring Creek, George Gill Range, A.C. Beauglehole 20561, 11.x.1966, fl.fr. (AD); Bagots Creek, George Gill Range, A.C. Beauglehole 23525, 9.vii.1967, fr. (NT); Bagots Creek, A.C. Beauglehole 27101, 16.vii.1968, fl. (NT); Bagots Creek, G. Chippendale s.n., 13.viii.1957, fl. (AD, CANB, NT); Gardiner Range, 23° 55' S, 131° 50' E, P.K. Latz 6656, 8.xi.1976, fl. (NT); West of Areyonga, 23° 56' S, 132° 00' E, P.K. Latz 6690, 8.xi.1976, fl. (NT). East end of George Gill Range, R. Tate s.n., 1894, fl. immature fr. (AD9/448202); Bagots Creek Gorge, R. Tate s.n., 1894, fl.fr. (AD95709089).

Affinities

Eremophila ovata and *E. strongylophylla* are very closely allied, and may have been derived from a widespread common ancestor. The two species are now widely separated geographically, and have diverged sufficiently in my opinion to be considered distinct. *E. ovata* is confined to the George Gill and Gardiner Ranges of Central Australia while *E. strongylophylla* occurs in the region of Shark Bay in the extreme west of Western Australia (see Map 1).

Many vegetative and floral features of the two species are similar and a considerable degree of overlap occurs. However, the two differ markedly in the leaf and fruit. The leaves of *E. ovata* are ovate with a well developed subterete petiole. The indumentum of the two leaf surfaces differs in density of the hairs and the upper surface is glabrous in many plants (including the type). The margins are flat. Leaves of *E. strongylophylla* are very widely obovate to orbicular with a very short broad petiole with well developed laminal expansions (Fig. 1. M, N). Indumentum is of similar density on both surfaces. The margins are slightly undulate. The fruit of *E. strongylophylla* is slightly larger than *E. ovata* and has a longer indumentum which is more or less floccose towards the apex. *Eremophila ovata* is also reported to be an odorous shrub unlike *E. strongylophylla*.

2. *Eremophila glutinosa* Chinnock sp. nov.

E. ramossissima Gardn. MS., Enum.Pl.Aust.Occ.3:120(1931); Gardn. ex Barlow, Aust.J.Bot.19:296(1971) *nomen nudum*; *Eremophila* sp., Grieve and Blackall, W.Aust. Wildfls.4:643(1975).

Ab *Eremophila granitica* S. Moore differt foliis densius aggregatis, pedicello vel sessili vel breve et segmentis calycis anguste lanceolatis longe acuminatis. (Fig. 2).

Type: Yagahong Hill, 30 km N of Yarabubba Homestead, Western Australia, 26° 54' S, 118° 40' E, *R.J. Chinnock 1021*, 14.ix.1973, fl. fr. (holotype: AD isotype: PERTH).

The specific epithet refers to the glutinous nature of the vegetative and floral parts.

Shrub 1-2 m tall with ascending or erect stems; *branchlets* terete, densely glandular hairy, extremely viscid in younger parts, the surface densely covered with sessile glands; the hairs and glands often obscured by the resin; bark light brown but covered with darker detritus and appearing dark grey flecked light brown; irregularly flaking and shallowly fissured; internodes 0.1-0.3 mm. *Leaves* alternate, sessile, erect or spreading, densely clustered, minutely hairy, the hairs often obscured by resin, densely covered with sessile glands but these also usually obscured by resin and only visible in older parts where the resin has dried, bright deep green, sessile, narrow linear, channelled above, often curved, obtus, (0.8-)-0.8-2.0(-2.7) cm long (0.5-)-0.6-1.0(-1.3) mm broad, viscid, often lustrous. *Flowers* solitary, axillary, shortly pedicellate; pedicel slightly compressed, densely glandular pubescent, (1.5-)-2-4.8(-6.5) mm long. *Calyx* 5-partite, imbricate, segments unequal the inner two narrower; green or pubescent, sparsely to very densely glandular and eglandular pubescent outside; the eglandular hairs long, white, segmented, common on the margins and lower half of the segment; inner surface glandular pubescent, smooth or tuberculate, the tubercles obscure or prominently raised; veins becoming prominent at the fruiting stage; narrow lanceolate, long acuminate, (6.0-)-6.8-9.5(-10.5) mm long, (1.2-)-1.8-2.6(-2.8) mm broad at the base. *Corolla* variable in length 1-2.5 cm, pale to dark lilac, darker spotted in tube, sparsely glandular pubescent outside, inside of tube hairy, with a dense band of lanate hairs extending from the base of the lowermost lobe down the tube; narrow cylindrical at the base for 2-4 mm, abruptly expanding into a laterally compressed tube; throat narrowly transversely elliptic or closed; lobes 5, the upper two fused for most of their length, reflexed, acute; the lower three spreading, the lowermost + broadly shortly sagittate, often projected above the lateral lobes closing the throat; lateral lobes ovate-elliptic, acute. *Stamens* included, filaments and anthers glabrous. *Ovary* oblong-ovoid, more or less ribbed, densely pubescent with larger eglandular hairs interspersed with shorter glandular ones, c. 4 mm long, 1.5 mm broad; style hirsute except near the apex, apex hooked. *Fruit* drupaceous, indumentum as for ovary but less dense, ovoid, slightly compressed, distinctly (more rarely obscurely) 4-ribbed, 2 restricted to the upper half and with minor coalescing ribs in the upper part between the primary ribs; often obscured by exocarp, 4-6 mm long, 3-4.5 mm broad. Seed unknown.

Distribution

Western Australia. Widespread in the Eremean Province especially the Wiluna — Meekatharra region (Map 1).

Representative specimens

Meekatharra Airport, *A.M. Ashby 4222*, 7.viii.1971, fl. (AD); 5 miles S of Bulga Downs Homestead, *B.A. Barlow 1335*, 5.viii.1967, fl. (AD); 25 km N of Cue, *B.A. Barlow 1637*, 22.vi.1969, v. (AD); Ca. 16 km S of Meekatharra, *B.A. Barlow 1641*, 23.vi.1969, fl. (AD); 8 km W of Laverton, *B.A. Barlow 1738*, 20.vi.1970, fl. (AD); Diemal Find, *J.S. Beard 4764*, 17.vii.1967, fl. (PERTH); Between Glen Ayle and Earraheedy, 25° 25' S, 121° 50' E, *J.S. Beard 4792*, 20.vii.1967, b. (PERTH, KP); Yagahong Hill, 30 km N of Yarabubba, 26° 54' S, 118° 40' E, *R.J. Chinnock 1021A*, 14.ix.1973, fl. fr. (AD); 54.7 km E of Meekatharra, *R.J. Chinnock 3966*, fr. (AD); 13 km S of Paynes Find, *H. Demarz 38*, 13.v.1968, fl. (PERTH, KP); 90 miles NE of Meekatharra, Doolgurra Station, *J. Elkington 332*, July-Aug. 1968, fl. (PERTH); 136 miles E of Wiluna on the Giles road, *A. Fairall 1930*, 25.vii.1966, fl. (PERTH); 72 km S of Meekatharra, *T. Loffler 27*, Aug. 1977, fl. (AD); near 6 mile creek, Yoothapina Station, *J. Morrissey 98*, June 1974, fl. (PERTH); 11 miles W of Meekatharra, *N.H. Speck 594*, 3.ix.1957, fl. (AD, CANB); 43 miles SE of Mileura Homestead, *N.H. Speck 699*, 7.ix.1957, fl. (CANB).



Fig. 2. *Eremophila glutinosa* Chinnock. A, habit; B, enlargement of stem showing the hairs and resin covered surface; C, upper portion of leaf, back and front view respectively; D, outer (left and centre) and inner right views of calyx-segments to show hair variation; E, corolla; F, mature fruit; G, gynoecium. (A-G, Chinnock 1021, except D, at left, Speck 594).

Chromosome Number: $n = 18$ (Barlow 1971)

Affinities

It is closely related to *E. granitica* differing in the more densely clustered leaves, short internodes, subsessile flowers and the small narrow lanceolate calyx-segments which do not enlarge in the fruiting stage.

Ecology

Eremophila glutinosa is a very widespread species particularly common in the Meekatharra and Wiluna regions. It grows abundantly on and around rocky granite and basic hills and outcrops and also on the heavy red clay loams in surrounding areas.

3. *Eremophila alatisepala* Chinnock sp. nov.

A speciebus *Eremophilae* aliis differt calyce et pedicello infra calycem valde alato. (Fig. 3).

Type: 5 km NW of Palparara, Gregory North District, Queensland 24° 46' S, 141° 26' E, R.E. Isaacson 20, 21.viii.1976 (holotype: AD; isotypes: BRI, CANB, K, NY).

The specific epithet is derived from the very prominent wings formed by the margins and bases of the calyx-segments and the upper pedicel which are diagnostic for this species.

Rounded shrub to 2 m tall and broad; branchlets, leaves, pedicel and calyx-segments glabrous, densely covered with sessile spherical glands, extremely viscid. *Branchlets* dark blackish-brown, leaf bases persistent, rough, internodes 2-3 mm. *Leaves* alternate, indistinctly petiolate, crowded, deep green, narrow linear-lanceolate, entire or slightly sinuate and sometimes the margins repand, attenuate towards the apex and base, (3.7-4.0-5.7(-6.0) cm long. (1.2-)1.7-3.5(-5.0) mm broad. *Flowers* axillary, solitary, drooping pedicellate; pedicel about 1 cm long, winged in the distal part. *Calyx* 5-partite, segments unequal, attached at the basal centre, pale yellow to greenish-yellow, glabrous outside, glandular pubescent within, the 3 outer, ovate, acute, one distinctly larger; their margins flanged out to form three wings which extend down the receptacle and upper part of the pedicel, 1.5-2.0 cm long, 6-8 mm broad, enlarging slightly in fruiting stage; 2 inner segments glandular pubescent on both surfaces, narrow oblong-lanceolate 9-10 mm long, 2.5-3 mm broad enlarging slightly in fruiting stage. *Corolla* cream, pinkish or orange-brown on the upper side, inside of tube and base of lobes maroon spotted, pubescent outside; the hairs glandular and eglandular, the tube villous in the lower part and extending to the throat on the lowermost side; bulbous at the base, slightly constructed above the ovary, then dilating above; lobes 5, unequal, broadly acute to obtuse, pointed, the upper pair 2.5 mm long and broad, the lower 3, 5-6 mm long and broad, the lowermost one slightly reflexed. *Stamens* shortly exserted, as long as the lobes or at length slightly longer; filaments villous in the lower quarter; anthers glabrous. *Ovary* ovoid, tapering into style, densely glandular pubescent, about 3 mm long, 2 mm broad, 4(6) loculed, 1-2 ovules per loculus; style glandular pubescent except in the upper quarter. *Fruit* drupaceous, broadly ovoid more or less biangular, distinctly and unevenly ribbed, indumentum as for ovary but less dense, 7-8.5 mm long, 5.5-6 mm broad. Seed unknown.

Distribution

This species is restricted to the Gregory North and Gregory South Districts, Queensland (Map 1).

Specimens examined

Gregory South District — Currawilla about 100 miles W of Windorah, S.L. Everist 4076, 29.viii.1949 (BRI, CANB); Gregory North District 5 km N of Palparara, 24° 46' S, 141° 26' E, September 1977, R.E. Isaacson 45 (AD, MEL); R.E. Isaacson 48 (AD, MO).

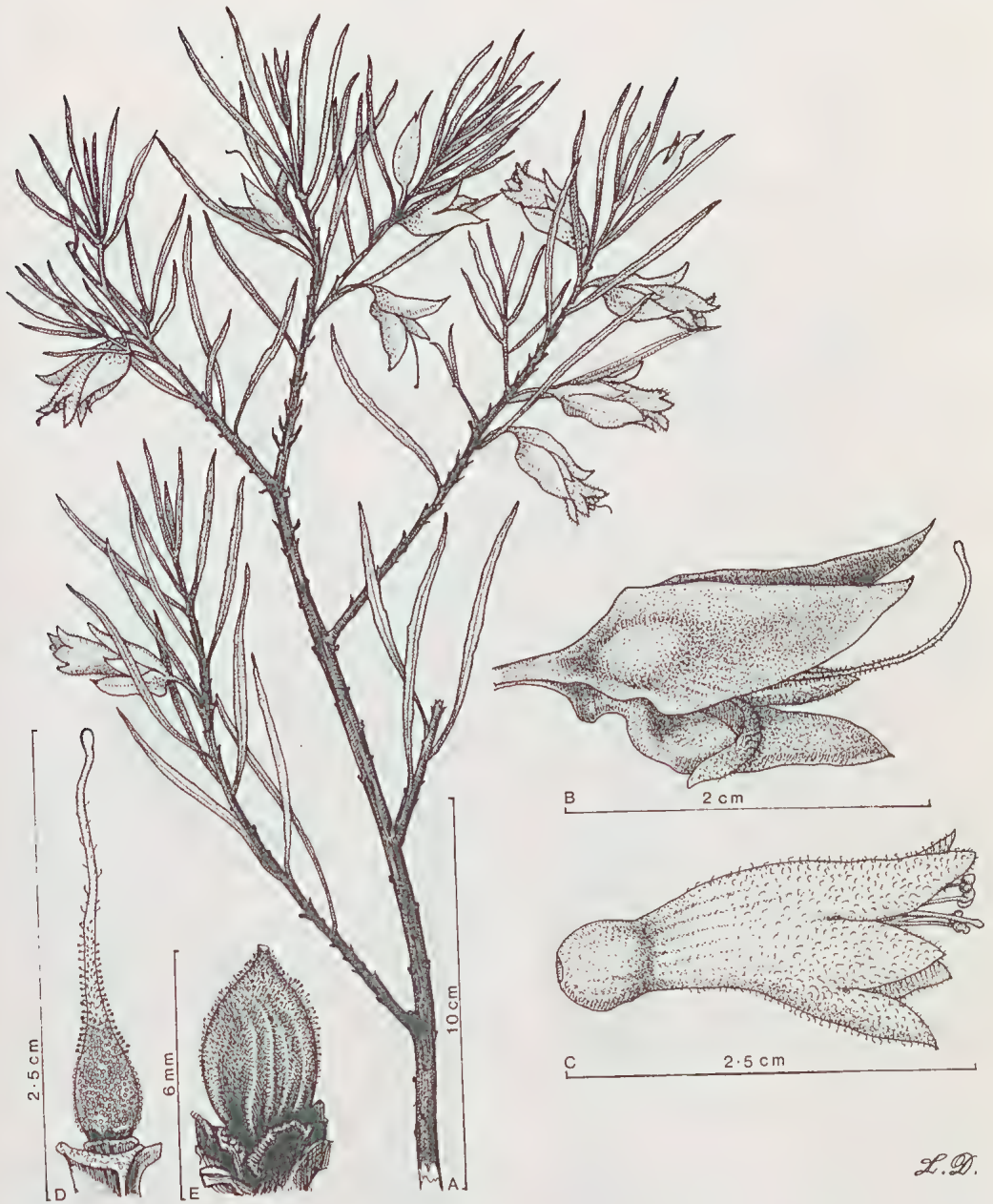


Fig. 3. *Eremophila alatisepala* Chinnoek. A, habit; B, clayx showing position of basicentral attachment and wings extending down to the pedicel; C, corolla; D, gynoecium; E, slightly immature fruit. (A-E, Isaacson 20).

Affinities

The species does not appear to be closely related to any others although vegetatively the plant resembles forms of *E. clarkei* Oldfield & Muell., which also exhibits small wing-like extensions at the calyx base. The corolla types in the two species are, however, quite different. That of *E. alatisepala* approaches the type found in *E. longifolia* (R.Br.) F. Muell. while that of *E. clarkei* is typical of the blue-flowered species such as *E. freelingii* F. Muell. and *E. elderi* F. Muell.

E. alatisepala is largely restricted to stony slopes and ridges although it sometimes occurs on heavy red clay flats in surrounding areas.

4. *Eremophila bicolor* Chinnock sp. nov.

Ab *Eremophila maculata* (Ker) F. Muell. differt floribus brevibus, stylo brevior quam staminibus, apice stigmatum valde dilatato, fascia pilorum recipientium angusta et praesentia macularum in fructu immaturo. (Fig. 4)

Type: 1.5 km E of the Lake Cronin Crossroads on the Norseman road, 32° 25' S, 119° 46' E, 11.xi.1978, R.J. Chinnock 4347 (holotype: AD; 150 type: CANB, K, MEL, PERTH, U.S.)

The specific epithet is derived from the strikingly different bud and open flower colours.

Shrub 0.3-1.6 m tall. *Branches* and branchlets ascending, glabrous, smooth except for a few irregularly scattered tubercles, more conspicuous in the older parts. *Leaves* alternate, indistinctly petiolate, spreading or secund, pale green, soft, thick, narrowly oblanceolate; apex acute, gradually tapering to the base, glabrous except for a minute glandular pubescence along the sunken midrib (upper side) and longer appressed eglandular hairs at the base of the petiole, (1.3-)1.8-4.3(-5) cm long, (2-)2.4-6(-8) mm broad. *Flowers* solitary in the leaf axils, pedicellate; pedicels straight or sigmoid, glabrous, 1.5-2 cm long. *Calyx* 5-partite, divided to base, imbricate in the lowermost part; segments subequal, glabrous outside, densely glandular pubescent within, ovate, 5-7 mm long, 2-2.5 mm broad, acuminate. *Corolla* (bud) orange above, yellow to yellowish-orange below. *Corolla* (mature) reddish-purple, slightly lighter beneath; pale whitish-purple inside with scattered darker purple flecks, glabrous outside, faintly verrucose above; glabrous within except for a few prominent long white arachnoid hairs on the lower portion of the lobes, the throat and uppermost portion of the tube; the hairs extending over the lower two-thirds of the lowermost lobe; tube 0.8-1.3 cm long, bulbous at the base for 3-5 mm constricted above the ovary, then gradually dilating, curved; lobes 5, upper 4 triangular, 4-5 mm long, lower lobe 9-10 mm long, ovate, acute, reflexed. *Stamens* 4, exserted; filaments curved or drooping, glabrous; anthers 2.5-3 mm long, glabrous. *Ovary* glabrous, green, weakly verrucose, ovoid 4-5 mm long, gradually tapering into style; style white, sparsely hirsute c. 2 cm long much shorter than stamens, abruptly dilating into a slightly compressed, sub-globular stigma; stigma yellow, with a pronounced transverse band of long receptive hairs. *Fruit* drupaceous, globular, slightly fleshy when immature, green, with prominent dark translucent spots, beaked; dry fruit 9-13 mm diameter, exocarp whitish-grey, papery; mesocarp dark brown, irregularly warty and fissured, woody; endocarp light brown, hard, woody; loculi 4, with one seed in each locule. Seed 4-5 mm long 1.5 mm broad, whitish-grey.

This species belongs to section *Stenochilus* (R.Br.) F. Muell.

Distribution

Western Australia — known only from the vicinity of the Lake Cronin Crossroads and Forrestania (Map 2). One collection made by Roe (undated) in the nineteenth century held at Vienna is labelled "K.G.S." which presumably is an abbreviation for King George's Sound, but it is highly unlikely that this species was collected in this vicinity. Roe did, however, lead an expedition to the "Interior of Western Australia" (Roe 1854) between September 8th, 1848 and February 3rd, 1849, which would have passed close to the known locations of this species, so it is possible that the reference to "K.G.S." is an error and the collection was made on this trip.



Fig. 4. *Eremophila bicolor* Chinnock. A, habit; B, flower showing prominent hairs on lower lip and short stigma; C, immature fruit showing prominent spotting; D, mature fruit with dried exocarp; E, F, transverse and longitudinal views of mature fruit (exocarp removed) showing the outer fissured and inner harder woody layers; G, front and side view of stigmatic apex of gynoecium to show the dilated nature of the apex and the prominent narrow band of receptive hairs. (A-G, cultivated plant, Adelaide, ex Kings Park).

Specimens examined

1.6 km E of Lake Cronin Crossroads 32° 25' S, 119° 46' E, *R.J. Chinnock 4143*, 25.ix. 1977, b, fr. (AD, PERTH); cultivated in Adelaide *R.J. Chinnock 4203*, Nov. 1977, fl. (AD); *R.J. Chinnock 4215*, 28.i.1978, fr. (AD); 9 km west of Forrestania, *C.A. Gardner 15896*, 10.xii.1964, fl. (PERTH); *Forrestania*, *H. Steedman a.n.*, Oct. 1930, fl. (PERTH); *K.G.S., Roe s.n.*, no date, fl. (W).

Affinities

Eremophila bicolor is related to *E. maculata* (Ker) F. Muell. It differs in its growth habit, glabrous branches, glabrous margins of the calyx segments, the shorter corolla tube, the stigmatic apex of the style and the prominently spotted immature fruits.

The well developed dilated stigmatic zone at the apex of the style, and the significantly shorter style are features unique to this species.

Another species, *E. laanii* F. Muell., superficially resembles *E. bicolor*, but it can be easily distinguished by its pubescent stems and leaves and its subsessile flowers.

5. *Eremophila purpurascens* Chinnock sp. nov.

Ab Eremophila alternifolia R. Br. differt foliis parvis obovatis et pedicello calyceque subtiliter glanduloso-pubescenti. (Fig. 5)

Type: Jimberlana Hill, 7 km NE of Norseman, Western Australia. 32° 09' S, 121° 49' E, *R.J. Chinnock 4184*, 28.ix.1977, fl. (holotype: AD; isotypes: CANB, K, MEL, PERTH, US).

The specific epithet is derived from the colour of the calyx-segments.

Shrub to 1.5 m tall. *Branches* and branchlets ascending, rigid, interlacing and sometimes more or less divaricate, glabrous, but densely covered with slightly raised glands, tuberculate. *Leaves* alternate, indistinctly petiolate, spreading, clustered, often only at the branch tips, glabrous but densely covered with sessile appressed glands, dark green, very thick and almost fleshy; lower surface with prominent tubercles, obovate to spatulate, apex obtuse, recurved, mucronate, gradually tapering to a cuneate base, (4.8-)7.5-12.0(-13.7) mm long, (2.1-)3-6(-7.4) mm broad (in cultivation leaves may be up to 24 mm long and 10 mm broad). *Flowers* solitary in the axils, pedicellate; pedicel sigmoid, purplish, densely pubescent, the hairs glandular and eglandular, occasionally sparsely tuberculate, sigmoid, 1-2.5 cm long. *Calyx* 5-partite, divided to the base, imbricate; segments unequal, greenish near the base and midrib otherwise purple, usually more intense along the margin, widely to very widely obovate, mucronate; glandular pubescent outside and within; margin irregular; 8-11 mm long, 6-8 mm broad. *Corolla* bud yellow, spotted purple, open flower light purple, darker purple spotted on the tube and lower lobe outside, inside yellow in the lower tube, otherwise purple, purple spotted on lowermost lobe and adjacent margins of throat or unspotted; sparsely glandular pubescent outside and within, tube short, 1-1.2 cm long, bulbous at the base, constricted above the ovary, dilating above into a narrow curved tube; lobes 5, upper 4 widely spaced, triangular, 4-7 mm long, 4-5 mm broad at the base, lowermost lobe 12-13 mm long, reflexed, apex acut to obtuse. *Stamens* 4, shortly exserted, glabrous; filaments 1.4-1.8 mm long; anthers about 2 mm long. *Ovary* glabrous, oblong, 2-2.5 mm long, loculi 4, 1 ovule per loculus; style glabrous, c. 2 cm long. *Fruit* drupaceous, conical, drying black, the exocarp wrinkled, 4-4.2 mm long, 2.5-3 mm broad at the base. Seed 2.2-2.3 mm long 0.5 mm broad, oblong, white.

This species belongs to section *Stenochilus* (R.Br.) F. Muell.



Fig. 5. *Eremophila purpurascens* Chinnock. A, habit; B, upper and lower leaf surface, respectively; C, flower; D, mature fruit; E, gynoecium. (A-C, E, Chinnock 4184; D, Donner 4642).

Distribution

Western Australia — restricted to the granite hills around Norseman (Map 2).

Specimens examined

0.5 m N of Causeway, Norseman, 32° 10' S, 121° 45' E, *J.S. Beard 5201*, 24.x.1967, fl. fr. (KP, PERTH); ca. 5 km NE of Norseman, P.O. ca. 1 km N of Eyre Highway, *A.C. Beauglehole 49379*, 29.viii.1974, fl. (AD); Hills 7 miles from Norseman, *W.E. Blackall 1222*, 30.x.1931, fr. (PERTH); Hills near Norseman, *W.E. Blackall 1224*, Oct. 1931, fl. fr. (PERTH); Norseman, *W.D. Campbell s.n.*, Oct. 1904, fr. (PERTH); south-western side of Lake Cowan, 1 km S of Causeway, 32° 10' S, 121° 44' E, *R.J. Chinnock 3035*, 11.ix.1976, v. (AD); Jemberlana Hill, 7 km NE of Norseman, 32° 09' S, 121° 49' E, *R.J. Chinnock 3328*, 10.x.1976, b. (AD); *R.J. Chinnock 4185*, 28.ix.1977, fl. (AD, BRI, NT); ca. 5 km NE of Norseman at Jemberlana, 32° 09' S, 121° 48' E, *N.N. Donner 4642*, 9.ix.1973, fl. fr. (AD); Norseman Hills, *C.A. Gardner 2921*, 27.ix.1931, fr. (PERTH); Norseman, *C.A. Gardner 2922*, 29.x.1931, fl. (PERTH); ca. 8 km NE of Norseman, 32° 10' S, 121° 47' E, *D.J.E. Whibley 4578*, 29.x.1974, fl. fr. (AD, PERTH); no details, *M.M. McCole 7032*, no date, fl. (PERTH).

Affinities

Eremophila purpurascens is related to *E. alternifolia*. Both species have glabrous branches and leaves covered with sessile glands, prominently spotted stenochiloid flowers, shortly exserted anthers and small conical fruits. *E. purpurascens* differs from *E. alternifolia* in the more densely tubercled branches, size and shape of the leaves, the presence of raised tubercles on the under side of the leaves, the densely glandular pubescent pedicel and calyx-segments. The two species form a well defined unit within section *Stenochilus*.

6. *Eremophila gibbosa* Chinnock sp. nov.

Ab *Eremophila serrulata* (A. Cunn. ex A. DC.) Druce differt ramis foliisque glabris, caespite pilorum denso in apice segmentorum calycis et fructu obovoideo apice depresso. (Fig. 6).

Type: 9.2 km SSE of Norseman just S of Woolyeeny Hill, Western Australia. 32° 17' S, 121° 48' E, *R.J. Chinnock 3323*, 10.x.1976 (holotype: AD; isotypes: CANB, K, MEL, US, PERTH).

The specific epithet refers to the pronounced swelling of the upper portion of the fruit.

Shrub 0.5-3.2 m tall with ascending or erect branches, root suckering and sometimes forming dense thickets. *Branchlets* glabrous, terete, or slightly flattened, pale brown, glands, extremely viscid, shiny. *Leaves* alternate, glabrous or with a tuft of whitish-yellow hairs at the apex, especially when young, distinctly petiolate; petiole (0.28-)0.4-0.8(-1.0) cm long; blade ovate to elliptic more rarely widely elliptic; obtuse or broadly acute at the apex, mucronate; the base widely cuneate; margins entire or obscurely serrate, surfaces covered with numerous sessile glands, usually obscured by resin, extremely viscid, shiny or vernicose when fresh, (0.95-)1.5-3.5(-4.5) cm long, (0.4-)0.7-1.8(-2.2) cm broad. *Flowers* solitary, axillary, pedicellate; pedicel sigmoid, glabrous, papillose, viscid, 1-1.5 cm long; *calyx* 5-partite; segments imbricate, green or purplish, oblong to obovate, apex obtuse, mucronate, glabrous except for a dense white tuft of hair at the apex, especially on the inner surface, 6-7 mm long, 1.5-3 mm broad becoming only slightly enlarged and reticulated at fruiting stage. *Corolla* yellowish-green, the tube sparsely glandular pubescent, the 4 upper lobes moderately densely pubescent the hairs crisped, glandular; bulbous at the base, very slightly constructed above the ovary, expanding into a narrow curved tube; lobes unequal the upper 4, small obtuse, the lower lobe deeply cut into tube to half its length, reflexed, apex acute obtuse, bilobed, with numerous crisped hairs near the apex and along margins. *Stamens* 4, exserted; filaments white, glabrous, the upper pair shorter about 2 cm long; anthers glabrous, brownish-yellow, 1.5-2 mm long, 1 mm broad. *Ovary* glabrous, oblong-ovoid, obtruse, loculi 4, 1 ovule per loculus, style sparsely hirsute, about 2 cm long, apex notched. *Fruit* drupaceous, glabrous, subglobose, apex truncate or depressed, more or less bilobed, the two lobes slightly separating and more or less incurved, beaked at the styler edge, touching and often forming a small sinus beneath; exocarp grey, wrinkled; 3-4 mm long and broad. *Seed* white, about 2 mm long 0.7-0.9 mm broad.

This species belongs to section *Stenochilus* (R.Br.) F. Muell.

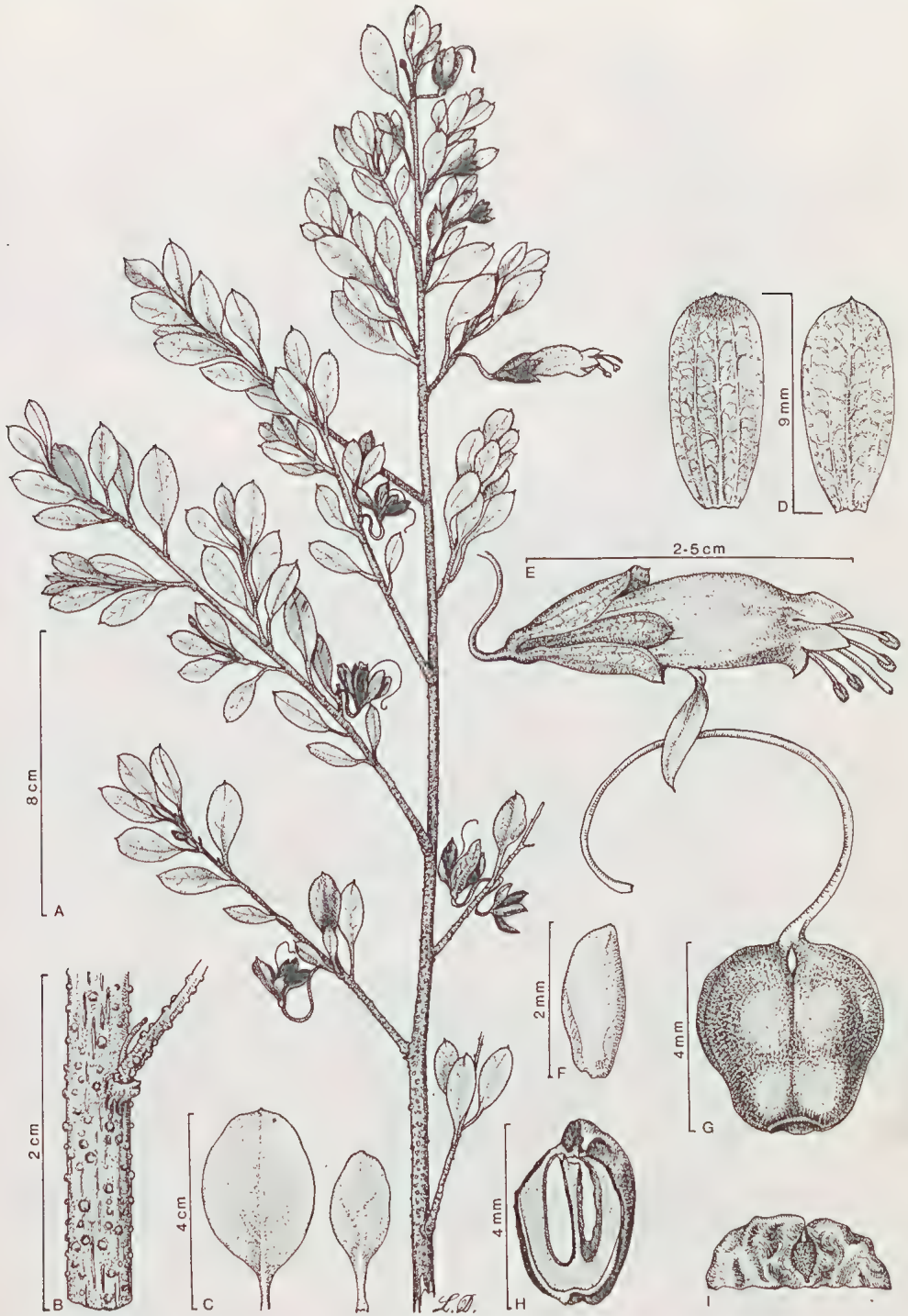


Fig. 6. *Eremophila gibbosa* Chinnock. A, habit; B, enlargement of branch to show tubercles; C, leaves; D, calyx-segments, inner and outer surfaces, respectively; E, flower; F, seed; G, mature fruit with style still attached (note sinus below style); H, longitudinal view through fruit; I, apex of mature fruit showing sinus and touching beaks after the style is lost. (A-I, Chinnock 3324).

Distribution

Western Australia, Coolgardie District extending from the Fraser Range to the Norseman, Coolgardie and Kalgoorlie areas (Map 3).

Representative specimens

6 km E of Norseman, *B.A. Barlow 1580*, 18.vi.1969, b, fl. (AD); 1 mile S of Broad Arrow, *B.A. Barlow 1593*, 19.vi.1969, b, fl. (AD); 2 miles S of Norseman, *J.S. Beard 6341*, 15.ix.1970, fr. (PERTH); 14 miles SE of Coolgardie, *N.T. Burbidge s.n.*, 19.iv.1947, fr. (CANB 14464); 9.2 km SSE of Norseman, just S of Woolyeenyer Hill, 32° 17' S, 121° 48' E, *R.J. Chinnock 3007*, 10.ix.1976 (AD, PERTH); 35.5 km SSW of Coolgardie, just S of Gnarlbine Rock, 31° 11' S, 120° 56' E, *R.J. Chinnock 3076*, 16.ix.1976, imm. fr. (AD); Western edge of Fraser Range, 100.8 km E of Norseman, 32° 02' 30" S, 122° 44' E, *R.J. Chinnock 3340*, 11.x.1976, fr. (AD, PERTH); 46.7 km WSW of Coolgardie, 31° 06' 30" S, 120° 44' E, *R.J. Chinnock 3668*, 8.viii.1977, fl.fr. (AD); Near McPherson Rock, 31 km S of Norseman *M.D. Crisp 978*, 8.viii.1975, b, fl. (CBG); Coolgardie, *R. Helms s.n.*, July 1899, fl. (AD); Fraser Range, *M.E. Phillips s.n.*, 3.ix.1968, fl.fr. (CBG 023245); Beacon Hill, Norseman, *M.E. Phillips s.n.*, 4.ix.1968, fl. (CBG 026169); 16.1 km from Coolgardie towards Southern Cross, *M.E. Phillips WA68/486*, 5.ix.1968, fl.fr. (CBG); Coolgardie, *C.A. White s.n.*, Aug. 1897, imm. fr. (PERTH).

Chromosome Number: $n = 18$ (Barlow 1971, *E. serrulata* p.p.).

Affinities

Eremophila gibbosa is closely related to *E. virens* Gardner. Both species have glabrous vegetative parts except for the upper side of the petiole and the leaf apex but differ in the size and shape of the leaves and calyx-segments. They exhibit remarkable similarities in the flower and fruit. The corolla of *E. virens* is densely pubescent outside, the hairs crisped while *E. gibbosa* has a sparsely pubescent corolla except for the lobes. Glandular hairs are present on the corolla of *E. gibbosa*. In both species the calyx is glabrous except for a dense white tuft of hairs on the inner surface near the apex of the segments. This is more extensive in *E. virens*. Both species have fruits of similar size and shape.

Although *E. gibbosa* is closely related to *E. virens* it has usually been included under *E. serrulata* A. Cunn. ex Benth. These three species together with at least one other undescribed one form a well defined group of green flowered species within section *Stenochilus*. *E. serrulata* is an extremely variable and widespread species extending from Western New South Wales through Central and South Australia to Western Australia. The leaves of this species range from ovate, elliptic to suborbicular and are comparable in size and shape with *E. gibbosa*. However, the presence of hairs on the leaves and stems, the absence of a dense white tuft of hair at the apex of the calyx segment and the globular fruit readily distinguish this species from *E. gibbosa*.

Ecology

The three species, as far as I am aware, do not overlap in distribution. *E. gibbosa* occurs on red clay loams and on rocky hills in the Norseman-Coolgardie area and extends just slightly north of Kalgoorlie; *E. virens* is restricted to the Champion area north of Merredin and *E. serrulata* occurs on rocky slopes and outcrops in areas to the north and east of Champion. Both *E. virens* and *E. gibbosa* appear to favour disturbed sites, and the latter species is particularly common on road sides.

Cultivation

This species is now becoming widespread in the Adelaide region. It will establish from cuttings, but is more easily obtained from the numerous root suckers which develop readily.

7. *Eremophila serpens* Chinnock sp. nov.

Ab *Eremophila serrulata* (A. Cunn. ex A. DC.) Druce differt absentia pilorum stellatorum in folliis ramisque, pedicello brevi, calyce parvo, fascia in corolla brunneola et filamentis styloque purpureo. (Fig. 7).

Type: 18 miles (c. 29 km) east of Newdegate on the Lake King road, Western Australia. *A.S. George 9283*, 25.iv.1969, fl. fr. (holotype: PERTH; isotypes: CANB, AD, K).

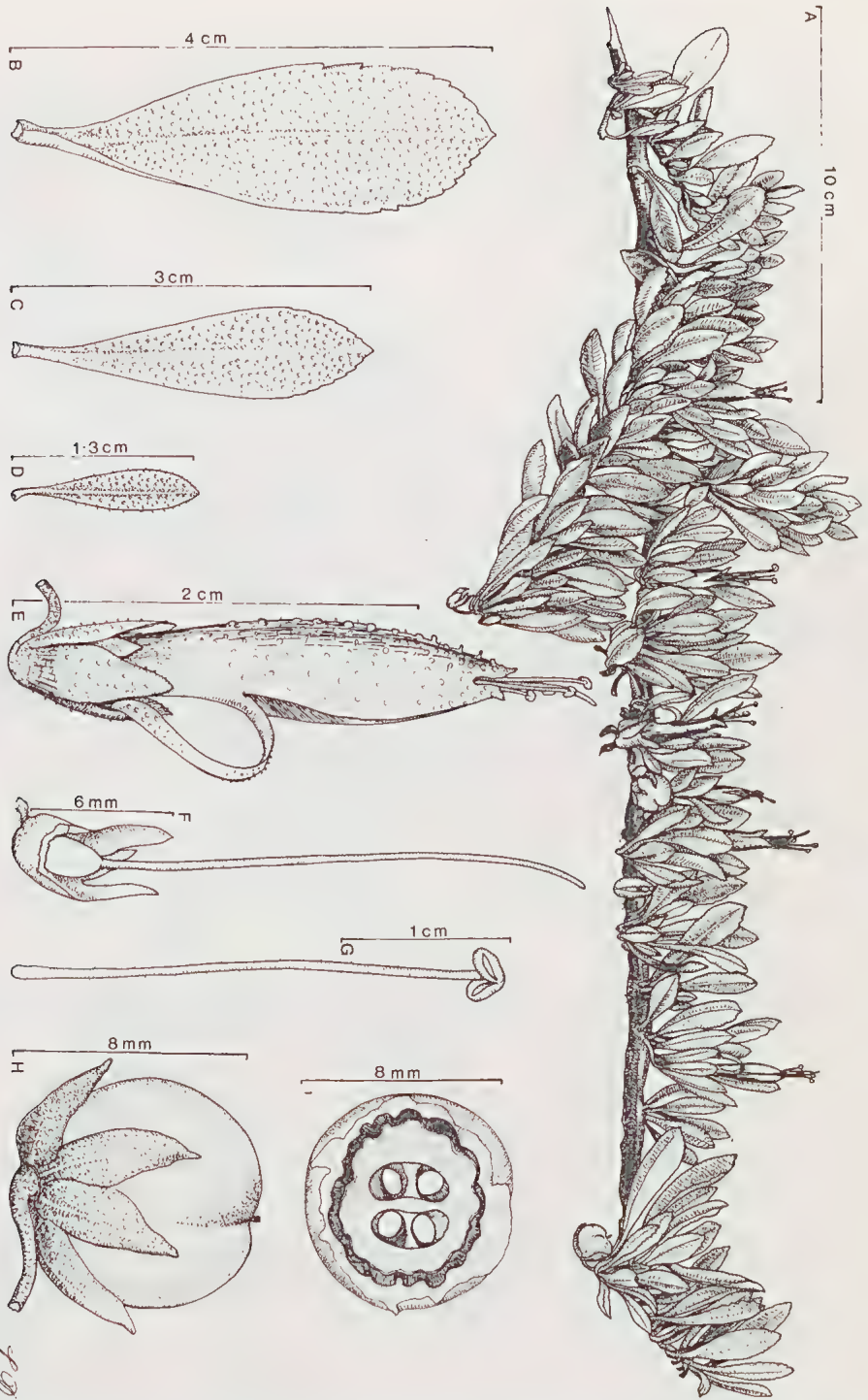


Fig. 7. *Eremophila serpens* Chinnock. A, habit; B-D, leaf variation on one plant; E, flower showing prominent tubercles on the corolla; F, gynoecium; G, stamen; H, I, side view and cross-section of mature fruit and note the papyrous exocarp separated from the inner layers. (A.-H, cultivated plant, Adelaide Botanic Gardens).

The specific epithet is taken from the prostrate habit.

Stems and branches prostrate, creeping and forming large patches, glabrous; at first purple, slightly fleshy, irregularly tuberculate, 3.5-5 mm diameter; becoming woody in the older parts, 1.5-2.5 cm diameter, pale brown; rooting freely at nodes except in the youngest parts; lateral branches of limited growth or forming normal long stems. *Leaves* alternate, indistinctly petiolate, erect or slightly spreading, glabrous, oblanceolate, serrate in the upper half often irregularly so, apex broadly acute, blade gradually tapering into an indistinct petiole, cuneate, surfaces densely covered with slightly raised glands when fresh, prominently punctate when dried, (3.1-)3.2-4.3(-4.7) cm long, (0.5-)0.85-1.2(-1.4) cm broad. *Flowers* solitary or 2-nate, erect, axillary along the main stems or on the short lateral branches often obscured by the leaves and only the upper portions of the stamens and gynoecium visible, pedicellate; pedicel rugose, (4-)5-7(-10) mm long. *Calyx* 5-partite, unequal, outer segments lanceolate, acute, 6-7 mm long, 2.0-2.5 mm broad, enlarging in fruiting stage to 10-11 mm long, 3.0-3.5 mm broad, remaining herbaceous; inner segments slightly narrower and shorter; surfaces glabrous, viscid, margins especially in the upper part with glandular, simple and branched eglandular hairs. *Corolla* lime green, dark brownish-purple on the upper lip extending in a band from the two uppermost lobes down the tube, glabrous outside and within except for scattered glandular hairs on the inside of the lowermost lobe and adjacent tube; 2-2.6 cm long, markedly tuberculate; bulbous at the base constricting slightly above the ovary then expanding into a narrow tube; lobes unequal the upper 4 acute, 2-2.5 mm long, the lower lobe deeply cut into the tube, recurved, when straightened reaching the apex of the lower upper lobes, apex more or less pouched. *Stamens* 4, exserted; filaments purple, lighter towards the base, sparsely glandular pubescent, the lower pair slightly longer c. 3 cm; anthers purplish-black, small c. 1.5 mm long, 1 mm broad; *ovary* oblong, glabrous, green, 2 mm long, 1 mm broad, slightly compressed, dilating at the base into a broad disk (nectary), loculi 4, 1 ovule per loculus; style purple to base, glabrous. *Fruit* drupaceous, globular 7-9 mm diameter, exocarp papery, grey, mesocarp brown, rugose. *Seed* pale brown, oblong-ovoid c. 2.5 mm long, 1 mm broad.

This species belongs to section *Stenochilus* (R.Br.) F. Muell.

Distribution

Western Australia, Coolgardie District; known only from the Hyden-Lake King-Newdegate area (Map 2).

Specimens examined

Cultivated at Adelaide Botanic Gardens, R.J. Chinnock 4218, Feb. 1978, fl. fr. (AD); Newdegate — Lake King road, F.W. Humphreys s.n., 30.v.1964, fl. (PERTH); 23 miles W of Lake King, F. Lullfitz 3942, 29.xi.1964, fl. fri. (PERTH).

Cultivation

See under *Eremophila biserrata*.

8. *Eremophila biserrata* Chinnock sp. nov.

Ab *Eremophila serpenti* differt ramis pubescentibus, foliis biserratis pilis in petiolo, corolla pubescenti et fructu pyriformi (Figs 8, 9).

Type: On track 4 km N of the Hyden-Lake Cronin road, 5.5 km W of Lake Cronin crossroads, Western Australia. 32° 23' S, 119° 41' E, R.J. Chinnock 3250, 6.x.1976, fl. (holotype: AD97704248; isotypes: AD, CANB, K, NY, PERTH).

The specific epithet is derived from the biserrate nature of the leaves.

Stems and branches prostrate, creeping and forming large patches, densely glandular pubescent, becoming woody and longitudinally fissured, light brown 3-5 mm diameter, rooting freely at nodes except in the youngest parts; lateral branches of limited growth or developing into normal long stems. *Leaves* alternate, petiolate, erect or slightly spreading,



Fig. 8. *Eremophila biserrata* Chincock A. habit of whole plant (small); B. flower in axil of leaf; C. D. mature fruit; E. cross-section of fruit (exocarp removed); F. seed. (A-F, Chincock 3250).

clustered, on the lateral shoots rosetted, glandular pubescent especially on the petiole, the lower part of the blade and the margin, oblanceolate to spatulate, margins biserrate and sometimes deeply incised, apex obtuse to almost truncate often distinctly trifid, blade gradually tapering into petiole, cuneate, surfaces glandular punctate, (1.4-)1.8-2.4(-2.8) cm long, (-0.35)0.5-0.9(-1.1) cm broad. *Flowers* solitary, erect, axillary along the main stems or on the short lateral branches, often obscured by the leaves and only the upper portions of the stamens and gynoecium visible; pedicel glandular pubescent, 3-5(-7) mm long, receptacle bulbous, glandular pubescent, ribbed. *Calyx* 5-partite; segments imbricate, glandular pubescent outside and within; outer 3 segments oblong-acute 4-5 mm long, 1.5-2 mm broad, inner segments narrower, 1 mm broad. *Corolla* lime green to yellowish-green, dark brownish-purple on the upper lip extending in a band from the two uppermost lobes down the tube, glandular pubescent outside and within; slightly tuberculate in the vicinity of the 4 upper lobes; bulbous at the base, constricted above the ovary then expanding into a narrow tube; lobes unequal, the upper 4 small, acute, the lower one linear-oblong deeply cut into tube, straight or very slightly recurved, not reaching the base of the upper lobes apex truncate. *Stamens* 4, exserted; filaments purple; sparsely glandular pubescent; the upper pair shorter c. 2-5 cm long; anthers purplish-black, small 1.2-1.5 mm long, c. 1 mm broad. *Ovary* glabrous, green, c. 1.5 mm long, 0.8 mm broad at the base, laterally compressed; loculi 4, 1 ovule per loculus; style purple, glabrous, stigmatic apex slightly dilated, yellow. *Fruit* drupaceous, 4.5-5 mm long 3-4 mm broad, oblong to pear-shaped, irregularly ribbed in the lower part, apex obtuse, partially splitting, and often beak-like; exocarp papery, grey, mesocarp blackish-brown faintly rugose. *Seed* pale yellowish-brown, ovoid, c. 2.5 mm long, mm broad at base.

This species belongs to section *Stenochilus* (R.Br.) F. Muell.

Distribution

Western Australia, Coolgardie District, known only from the Hyden-Forrestania-Lake King area.

Specimens examined

3 km E of Hyden near road junction to Wave Rock, 32° 27' S, 118° 50' E, R.J. Chinnock 4127, 25.ix.1977, fl. fr., (AD, PERTH, NSW), R.J. Chinnock 4128, 25.ix.1977, fl. fr. (AD); Lake Cronin, 32° 23' S, 119° 46' E, A.S. George 15105, 14.iii.1978, fl. (PERTH); Lake Cronin, 3.5 miles N of Crossroads, F. Lullfitz 13846, 25.xi.1964, fl. fr. (PERTH, KP).

Ecology

This species favours open situations on sandy or sandy clay saline soils. At the type locality plants were common on light brown sandy clay loams on outwash plains amongst regenerating mallee and numerous low growing Acacias.

Near Hyden (Chinnock 4127) it was found growing amongst *Eucalyptus* and *Melaleuca* spp. on a shallow rise in a saline depression. Associated ground species were *Disphyma clavellatum* (Haw.) Chinnock, *Atriplex* spp. and *Arthrocnemum* spp. The soil was particularly sandy with a small amount of organic detritus in the surface horizon. Lower horizons became progressively clayey.

Cultivation

E. biserrata and *E. serpens* are readily grown from cuttings and have been known in the Adelaide region for many years. They are excellent ground cover species and thrive on the alkaline soils of the Adelaide plains.

Affinities

Eremophila serpens and *E. biserrata* form a small but well defined group within section *Stenochilus*. The prostrate stems which root freely at nodes, the erect flowers with a curious colour combination make them quite unique. The predominantly yellowish-green corolla and leaf features suggest that they are probably related to the *E. serrulata* group of species which includes *E. serrulata*, *E. gibbosa* and *E. virens*.

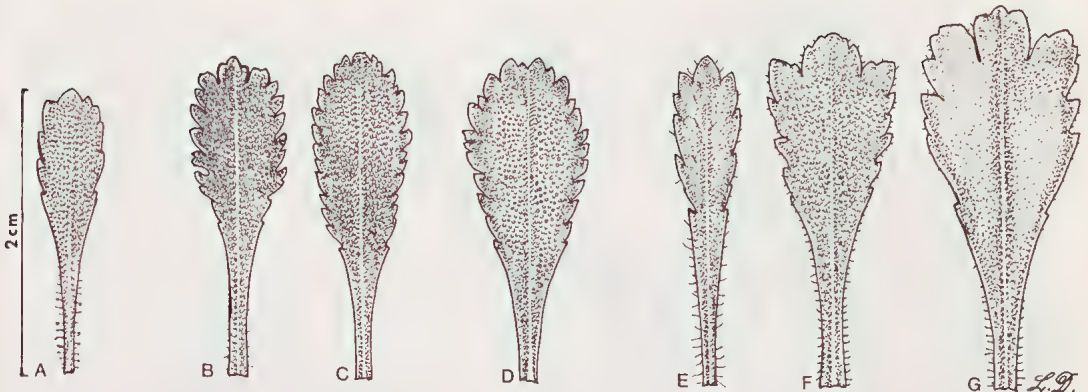


Fig. 9. *Eremophila biserrata* Chinnock. A-G, leaf variation. (A, Chinnock 4127; B, C, Chinnock 3250; D, Lullfitz 3846; E-G, Chinnock 4128).

9. *Eremophila verrucosa* Chinnock sp. nov.

Eremophila scopariae (R.Br.) F. Muell. affinis est sed differt squamis in ramis tubercula non tegentibus, foliis dense fasciculatis tuberculatis, corolla stellate pilosa et fructu piloso. (Fig. 10).

Type: Copper Hills 28° 00' S, 134° 26' E, Lake Eyre Basin, South Australia. Stoney slopes from creek flats to below flat tops. Common in Homestead area, *B.J. Knight* 259, 21.i.1978, fl. (holotype: AD; isotypes: CANB, MEL, NT, K, NY, MO).

The specific epithet refers to the prominently verrucose branches.

Shrub, erect or intricate, 1-2 m high. *Branches*, lepidote, densely tuberculate, tubercles not covered by the scales, evenly dispersed or in rows, orange-brown, translucent; internodes 2.5-4 mm. *Leaves* opposite, decussate, clustered, indistinctly petiolate, spreading, densely lepidote, narrow linear-lanceolate to narrow elliptic, channelled above and keeled below or flattened, sigmoid or straight in side view, (0.5-)1.0-1.4(-1.6) cm long 1.4-2.2 mm broad. *Flowers* solitary or paired, axillary, shortly pedicellate; pedicel compressed, densely lepidote 1.5-2.5 mm long. *Calyx* 5-partite, segments imbricate near the base, almost equal, densely white lepidote outside, densely glandular pubescent within except in the lower quarter, and with branched hairs along the margin near the apex, narrow linear-lanceolate, 2.5-5.5 mm long, 1.2-1.5 mm broad. *Corolla* lilac to mauve, dark purple spotted in lower part of tube above the construction and extending along the tube on the lower side to the base of the lowermost lobe, c. 1.5-2.2 cm long, densely stellate pubescent outside; the hairs interlacing or discrete, arachnoid hairy within the tube, densely hirsute at the construction around the filament bases, lobes glabrous; the tube at the base cylindrical for 4-5 mm then abruptly expanding into an oblique, laterally compressed, campanulate cup; lobes 5, unequal, obtuse, the lowermost dilated, 3.4-5 mm long, 2.5-3.5 mm broad. *Stamens* included; filaments white sparsely or densely bearded at the base otherwise glabrous; anthers yellow c. 2.2 mm long; with an intramarginal band of crisped arachnoid hairs. *Ovary* oblong-ovoid, c. 2 mm long, tomentose to lanate, 4-loculed 1 ovule per loculus; style 1.2-1.5 cm long, densely villous in the lower part, sparsely hairy above. *Fruit* drupaceous, ovoid to broadly ovoid, hard, 4.5-5 mm long, tomentose to lanate. *Seed* unknown.

This species belongs to section *Pholidia* (R.Br.) F. Muell.

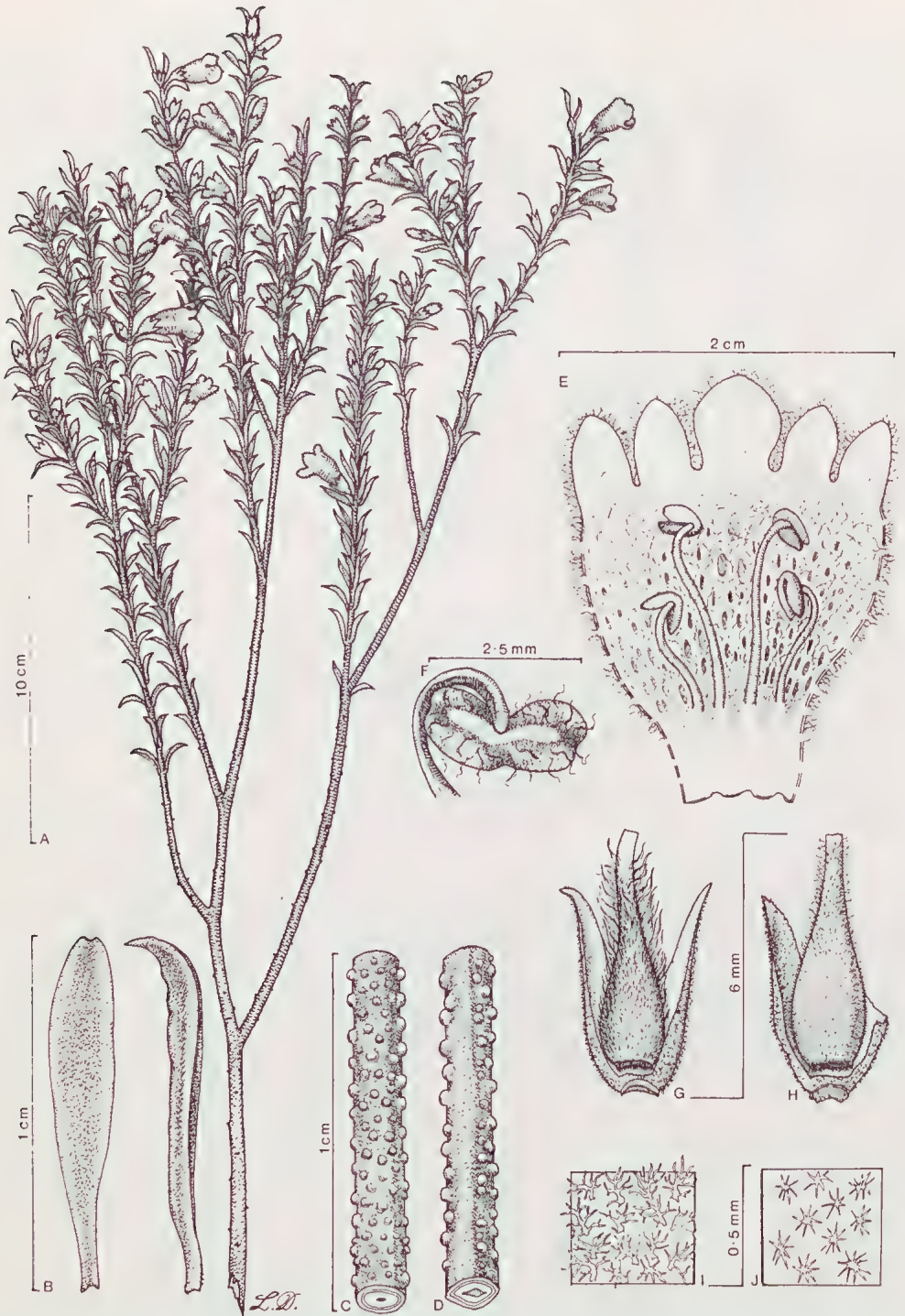


Fig. 10. *Eremophila verrucosa* Chinnock ssp. *verrucosa* (A-C, E-G, I) and ssp. *brevistellata* Chinnock (D, H, J). A, habit; B, leaf front and side view; C, D, enlargement of branch to show tubercle arrangement; E, opened corolla; F, anther showing hairs on the back; G, H, ovary and lower style showing hairs; I, J, hairs on corolla. (A-C, E-G, I, Clark-Edwards s.n. (AD97556119); D, H, J, Whibley 737).

Affinities

Eremophila verrucosa is closely allied to the widespread *E. scoparia* (R.Br.) F. Muell. and replaces it to the north in South Australia. It may be distinguished from *E. scoparia* by the scales not covering the numerous tubercles on the branchlets; the stellate pubescent corolla; intramarginal hairs on the anther backs and the densely tomentose to lanate ovary.

ssp. verrucosa

Corolla with hairs stellate, interlacing, with rays usually branched and longer than in *ssp. brevistellata*.

Distribution

South Australia. North-Western, Lake Eyre Basin and Nullarbor Regions (Map 1).

Specimens examined

Copper Hill on the Evelyn Creek, 27° 57' S, 133° 20' E.M. Clarke-Edwards s.n., 23.xi.1975, fl. (AD); As above 25.xi.1975, fl. fr. (AD, WELT, WIR, WRSL, Z, ZT); Evelyn Downs, ca. 120 km SW of Oodnadatta, E.H. Ising s.n., 20.xi.1924, fl. (AD); Stuart Range c. 70 km NNW of Millers Creek Homestead on dog fence, 29° 39' S, 135° 46' E, B.G. Lay 627, 10.x.1971, fl. (AD); Copper Hill near Homestead, F. & R. Mason s.n., 12.v.1977, fl. (AD 978274260); Wilkinson Lakes, ca. 100 km NE of Maralinga, R.C. Shearer 40, 43, 14.ii.1972, fr. (AD).

ssp. brevistellata Chinnock ssp. nov.

Corolla pilis stellatis discretis, radiis simplicibus brevioribus quam in *ssp. verrucosa*.

Type: Ca. 2 km E of Ooldea, South Australia. D.J.E. Whibley 737, 21.ix.1960, fl. (holotype: AD; isotypes: CANB, NSW, UC).

The sub-specific epithet refers to the short-rayed stellate hairs of the corolla.

Corolla with hairs stellate, discrete, with rays simple and shorter than in *ssp. verrucosa*.

Distribution

South Australia. Nullarbor region. Known only from near Ooldea (Map 1).

Other specimen examined

Ca. 1 km E of Ooldea, South Australia. P. Wilson 1181, 22.ix.1960, fl. (AD).

Ecology

The two subspecies appear to favour different soil types. *E. verrucosa* ssp. *verrucosa* is abundant on skeletal soils on rocky slopes around Copper Hill, whereas *E. verrucosa* ssp. *brevistellata* is known only from red sandy loams (or possibly sandhills) overlying limestone just east of Ooldea.

10. *Eremophila arachnoides* Chinnock sp. nov.

Ab *Eremophila dalyana* F. Muell. differt foliis ramisque glabrescentibus, corolla stellate pubescenti, antheris hirsutis et fructu succulento. (Fig. 11).

Type: 16.6 km SE of Yarrabubba Homestead, Western Australia. 27° 12' S, 118° 52' E, R.J. Chinnock 3995, 15.ix.1977 (holotype: AD; isotypes: CANB, K, PERTH, NY).

The specific epithet refers to the arachnoid hairs of the corolla.

Broom-like shrub to 3 m tall. *Branches* ascending, densely white lepidote at first, glabrescent, more or less 4-angled at first, terete in older parts, tuberculate; the tubercles circular and discreet, or elongated and often coalescing to form irregular ridges, internodes (3-)4-10 mm. *Leaves* opposite, indistinctly petiolate, erect or spreading, densely white lepidote at first, becoming sparsely lepidote or nude, narrow linear, terete or subterete and channelled above, straight or more or less sigmoid in side view or sharply recurved in the upper part, uncinat, (1.4-)1.9-3.1(-3.2) cm long, 0.7-1 mm broad. *Flowers* solitary or paired, axillary, pedicellate; pedicel 1-3.5 mm long, white lepidote. *Calyx* 5-partite, lepidote outside,



Fig. 11. *Eremophila arachnoides* Chinnock ssp. *arachnoides*. A, habit; B, enlargement of portion of branch showing tubercule arrangement, leaf and flower; C, gynoecium; D, anther showing hairs on back; E, F, transverse and longitudinal views through fruit to show fleshy mesocarp with resin cavities. (A-F, Chinnock 4003).

glabrous inside except near the apex, margins and apex hirsute. *Corolla* white to mauve (0.9-) 1.5-2.0(-2.4) cm long; densely white stellate pubescent outside, inside tube with short crisped arachnoid hairs, the hairs denser down the tube below the lowermost lobe, the lobes with short crisped hairs; the tube at the base cylindrical for 5-6 mm, abruptly dilating into a laterally compressed campanulate cup; lobes 5, subequal, obtuse, 2.5-3 mm long and wide. *Stamens* included; filaments bearded at the base; anthers yellow, 2-2.2 mm long, with a dense intramarginal band of crisped hairs. *Ovary* narrow ovoid, densely hairy, the hairs stellate or branched, 2-2.5 mm long, tapering into style, locules 4, usually 2 ovules per locule. *Fruit* drupaceous, rose pink, succulent sparsely pubescent at maturity, ovoid, drying dark grey or reddish, wrinkled, (5.2)5.5-6.5 mm long, 3.5-4.5 mm wide, 4 locular. *Seed* whitish, ovoid, 2.7 mm long 0.8 mm broad.

This species belongs to section *Pholidia* (R.Br.) F. Muell.

Affinities

Eremophila arachnoides is closest to *E. dalyana* F. Muell. which replaces it in the north-east of South Australia and extends into the Northern Territory and Queensland. The two species differ in the indumentum of the corolla, the presence or absence of hairs on the anther backs and the fruit shape, size and succulence. The fruit of *E. dalyana* is dry, whereas at least in the type subspecies of *E. arachnoides* it is succulent. *Eremophila arachnoides*, *E. dalyana* F. Muell., *E. pantonii* F. Muell., *E. scoparia* (R.Br.) F. Muell. and *E. verrucosa* form a very well defined group within section *Pholidia* differing from the other species of the section by the presence of a lepidote indumentum on the vegetative parts and at least the pedicel and calyx of the flower.

ssp. *arachnoides*

Branches with tubercles circular, discrete; *ovary* with hairs stellate.

Distribution

Western Australia (Map 2).

Specimens examined

12 km SSE of Yarrabubba Homestead 27° 12' S, 118° 53' E, *R.J. Chinnock 1045*, 14.ix.1973, fl. (AD); 12.2 km SSE of Yarrabubba, 16.ix.1977, *R.J. Chinnock 4002*, fl. (AD); *R.J. Chinnock 4003*, fl. fr. (AD); *R.J. Chinnock 4004*, fl. (AD).

ssp. *tenera* Chinnock ssp. nov.

Rami tuberculis saepe elongatis coalescentibusque ovarium pilis ramosis.

Type: 32 km W of Wynbring near the Mt Christie Siding, South Australia. 30° 33' S, 133° 12' E, *R.J. Chinnock 2639*, 28.ix.1975, fl. (holotype: AD; isotypes: A, K, PERTH).

The subspecific epithet refers to the long slender leaves.

Branches with tubercles often elongated and coalescing; *ovary* with branched hairs.

Distribution

Western and South Australia (Map 2).

Specimens examined

WESTERN AUSTRALIA. Erliston Creek, Bandy Station, *E. Oliver and T. Muir per Ashby 3946*, Aug. 1971, fl. (AD).

SOUTH AUSTRALIA. 150 miles N of Cook, *J.R. Ford s.n.*, May 1969, fl. (PERTH); Lake Meramange, 28° 29' S, 132° 08' E, *N. Ford 559*, 22.ix.1956, fl. (CANB, AD); 11 m S of Emu, *N. Ford 405*, 27.viii.1956, fl. (CANB); About 300 miles NW of Woomera, *F.L. Hill 183*, 10.x.1953, fl. (CANB); Barton, Nullarbor Plain, *E.H. Ising s.n.*, 17.ix.1926, fl. (AD 966080706); Commonwealth Hill Station, ca. 60 km NW of Wynbring Siding *B. Lay 671*, 26.ix.1971, fl. (AD, MO); ca. 80 km SE of Mt Lindsay, *R.B. Major 9*, 1966, fl. (AD).

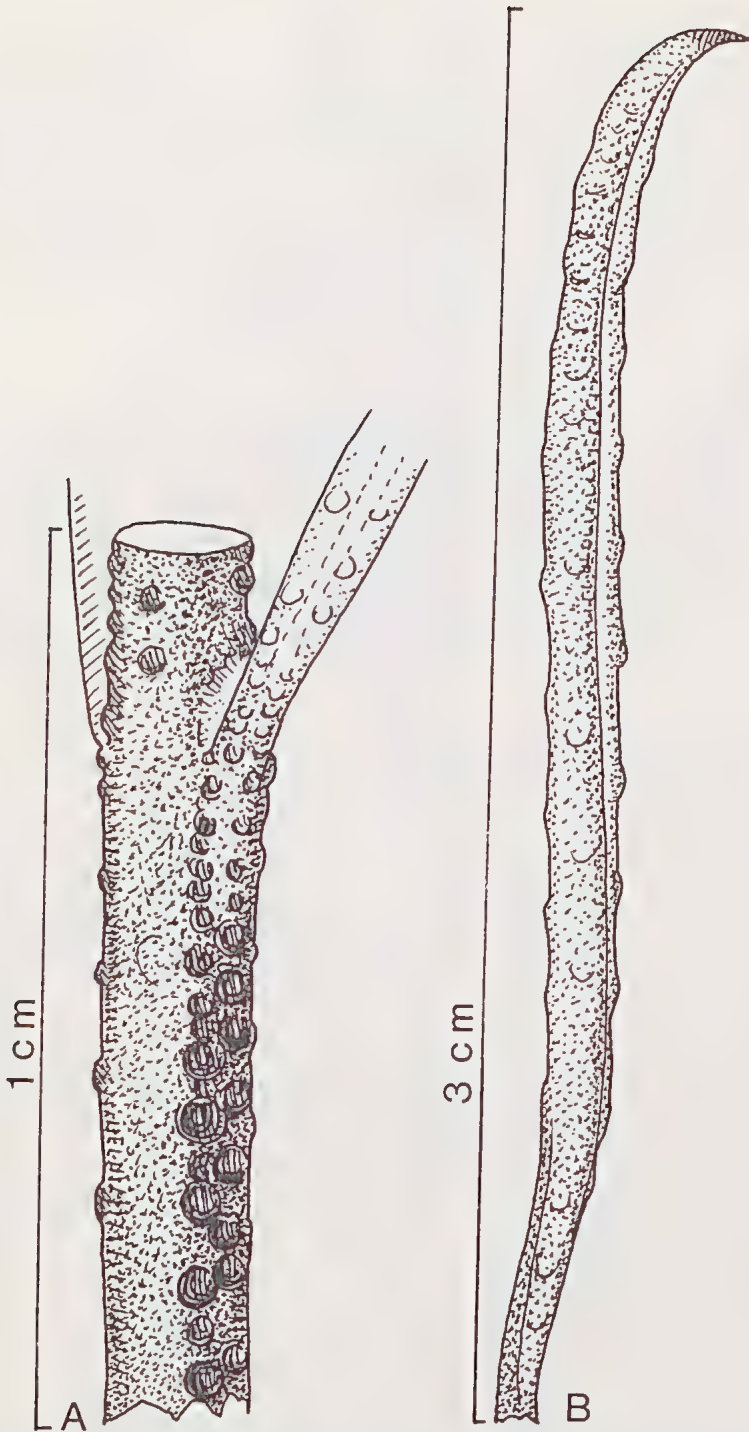
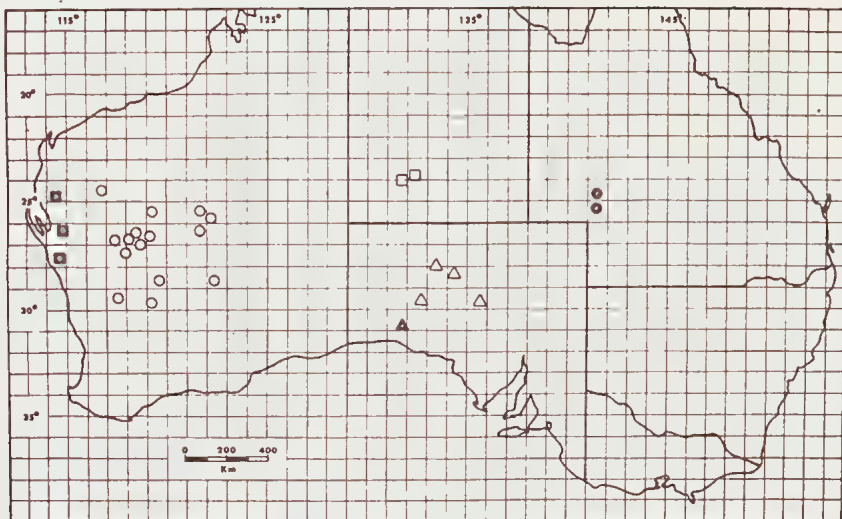
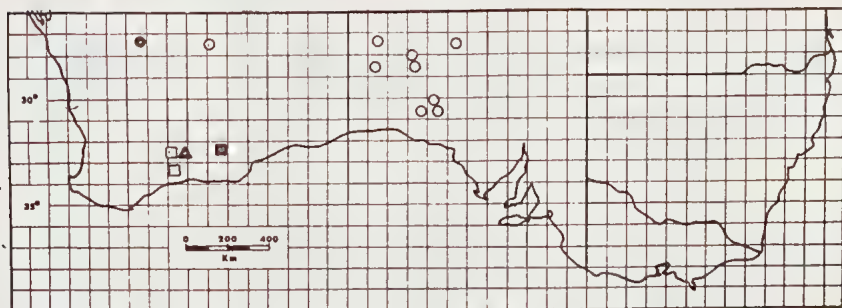


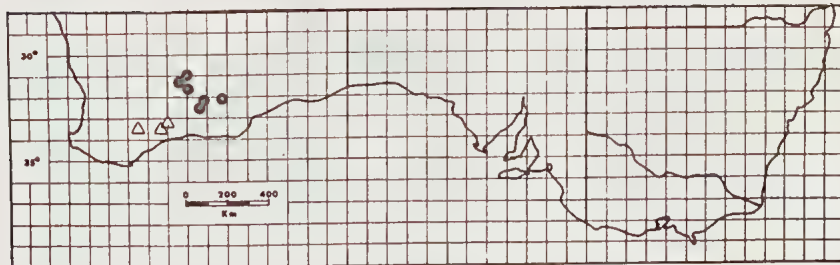
Fig. 12. *Eremophila arachnoides* ssp. *tenera* Chinnock. A, portion of branch showing coalescing tubercles; B, leaf.



- *E. alatisepala*
- *E. glutinosa*
- *E. ovata*
- *E. stronglyphylla*
- △ *E. verrucosa* ssp. *verrucosa*
- ▲ *E. verrucosa* ssp. *brevistellata*



- *E. arachnoides* ssp. *arachnoides*
- *E. arachnoides* ssp. *tenera*
- ▲ *E. bicolor*
- *E. purpurascens*
- *E. serpens*



- △ *E. biserrata*
- *E. gibbosa*

Maps 1-3. Distribution of *Eremophila* species and sub-species.

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